

CLAIMS

What is claimed is:

Claim 1 (currently amended): A method ~~of making a device (100)~~ for collecting mammalian cells ~~[(20)]~~, comprising the steps of:

- (a) providing a tube ~~(12)~~ ~~for collecting a final composition (30) having a volume of 100 parts, said tube (12)~~ having an open end ~~[(14)]~~ and a closed end, ~~[(16)]~~ that receives cells collected directly from a blood draw;
- (b) preloading compounds ~~[(22)]~~ including:
 - an anticoagulant agent ~~[(24)]~~, and
 - a fixative agent ~~[(26)]~~ into said tube ~~[(12)]~~, said fixative agent ~~[(26)]~~ selected from the group consisting of: diazolidinyl urea, imidazolidinyl urea, dimethylol-5,5 dimethylhydantoin, dimethylol urea, 2-bromo-2.-nitropropane-1,3-diol, oxazolidines, sodium hydroxymethyl glycinate, 5-hydroxymethoxymethyl-l-laza-3,7-dioxabicyclo [3.3.0]octane, 5-hydroxypoly [methyleneoxy]methyl-l-laza-3,7-dioxabicyclo [3.3.0]octane, 5-hydroxypoly[methyleneoxy]methyl-l-laza-3,7-dioxabicyclo [3.3.0] octane, quaternary adamantine and combinations thereof, wherein said compounds ~~[(22)]~~ are in a volume of no greater than 2 parts;
- (c) placing a closure ~~[(18)]~~ at said open end ~~[(14)]~~ of said tube ~~(12)~~; and to seal the tube in a manner creating and maintaining a pressure differential between atmospheric pressure outside said tube ~~[(12)]~~ and a pressure less than atmospheric pressure within said tube ~~[(12)]~~, the closure being such that it remains in place throughout blood draw and stabilization of cells;
- (d) wherein the preloaded compounds are employed in an amount and concentration sufficient so that after collection of cells from a blood draw in the tube, the ratio of the volume of any preloaded compounds to the combined

volume of the cells and the compounds is less than about 2:100, and so that the cells are stabilized directly and immediately upon blood draw.

Claim 2 (currently amended): The method of Claim 1, wherein said anticoagulant agent [(24)] is selected from the group consisting of ethylene diamine tetra acetic acid (EDTA), salts of EDTA, ethylene glycol tetra acetic acid (EGTA), salts of EGTA, hirudin, heparin, citric acid, salts of citric acid, oxalic acid, salts of citric acid, and a combination thereof.

Claim 3 (currently amended): The method of Claim 1, wherein the concentration of said fixative agent [(26)] preloaded in said tube [(12)] is less than about 1g/ml of preloaded compounds.

Claim 4 (currently amended): The method of Claim 1, wherein the concentration of said anticoagulant agent [(24)] preloaded in said tube [(12)] is less than about 0.3 g/ml of preloaded compounds.

Claim 5 (currently amended): The method of Claim 1, wherein said preloading step further includes preloading a polyacrylic acid [(28)] into said tube [(12)].

Claim 6 (cancelled)

Claim 7 (previously presented): The method of Claim 1, wherein said cells are selected from the group consisting of whole blood, epithelial cells, bone marrow, spinal fluid, abnormal tissue sample in a cellular suspension, and a combination thereof.

Claim 8 (currently amended): The method of Claim 1, further comprising the step of sterilizing said compounds [(22)] prior to preloading step.

Claim 9 (cancelled)

Claim 10 (currently amended): The method of Claim 1, further comprising the step of providing at least one component [(32)] selected from the group consisting of an alcohol swab, a gauze, a tube holder, a tourniquet, a glove, other cell collection tube, a needle, a lancet, adhesive strip, syringe, a test strip, a strip containing reagents for cell analysis, a packaging means for storing said at least one component and said collection device to form a kit, and a packaging means for transporting said collection device.

Claims 11-13 (cancelled)

Claim 14 (currently amended): A device [(100)] for collecting mammalian cells [(20)] comprising:

(a) ~~a collection container (10) for collecting a final composition (30) having a volume of 100 parts, said container (10) having an open end [(14)] and a closed end [(16)];~~

~~(b) a closure [(18)] at said open end [(14)] of said container [(10)], wherein said container has an internal pressure less than atmospheric pressure outside said container; and~~

(b) preloaded compounds [(22)] positioned within said container [(10)], wherein said compounds include an anticoagulant agent [(24)] and a fixative agent [(26)] selected from the group consisting of: diazolidinyl urea, imidazolidinyl urea, dimethoylol-5,5 dimethylhydantoin, dimethylol urea, 2-bromo-2-nitropropane-1,3-diol, oxazolidines, sodium hydroxymethyl glycinate, 5-hydroxymethoxymethyl-l-laza-3, 7-dioxabicyclo [3.3.0]octane, 5-hydroxymethyl-l-laza-3,7-dioxabicyclo [3.3.0]octane, 5-hydroxypoly[methyleneox]methyl-l-laza-3,7-dioxabicyclo

[3.3.0]octane, quaternary adamantine and combinations thereof, wherein ~~said compounds~~ ~~[[22]]~~ ~~are in a volume of no greater than 2 parts~~ the container is of sufficient size so that the ratio of the volume of any preloaded compounds to the combined volume of any cells collected in the container and any preloaded compounds cannot exceed about 2:100;

(c) a closure placed onto said open end of said container so that said container can maintain an internal pressure less than atmospheric pressure outside said container.

Claim 15 (currently amended): The device of Claim 14, wherein said anticoagulant agent ~~[[24]]~~ is selected from the group consisting of ethylene diamine tetra acetic acid (EDTA), salts of EDTA, ethylene glycol tetra acetic acid (EGTA), salts of EGTA, hirudin, heparin, citric acid, salts of citric acid, oxalic, salts of oxalic acid, and a combination thereof.

Claim 16 (currently amended): The device of Claim 14, wherein the concentration of said fixative agent ~~[[26]]~~ positioned within said container ~~[[10]]~~ is less than about 1 g/ml of preloaded compounds.

Claim 17 (currently amended): The device of Claim 14, wherein the concentration of said anticoagulant agent ~~[[24]]~~ positioned within said container ~~[[10]]~~ is less than about 0.3 g/ml of preloaded compounds.

Claim 18 (currently amended): The device of Claim 14, wherein the compounds ~~[[22]]~~ further include a polyacrylic acid ~~[[28]]~~.

Claim 19 (cancelled)

Claim 20 (previously presented): The device of Claim 14, wherein said cells are selected from the group consisting of whole blood, epithelial cells, bone marrow, spinal fluid, abnormal tissue sample in a cellular suspension, and a combination thereof.

Claim 21 (currently amended): The device of Claim 14, wherein said compounds [(22)] are sterile.

Claim 22 (cancelled)

Claim 23 (currently amended): A kit comprising the device of Claim 14 and at least one component [(32)] selected from the group consisting of an alcohol swab, a gauze, a tube holder, a tourniquet, a glove, other cell collection tube, a needle, a lancet, adhesive strip, syringe, a test strip, a strip containing reagents for cell analysis, a packaging means for storing said at least one component and said collection device to form a kit, and a packaging means for transporting said collection device.

Claims 24-26 (cancelled)

Claim 27 (currently amended): A method for preparing mammalian cells for analysis, said method comprising the steps of:

(a) providing a closed collection container ~~(10) for collecting a final composition (30)~~ having a volume of 100 parts, said container [(10)] having an internal pressure less than atmospheric pressure outside said container, wherein said collection container [(10)] contains preloaded compounds [(22)] including an anticoagulant agent [(24)] and a fixative agent [(26)] selected from the group consisting of: diazolidinyl urea, imidazolidinyl urea, dimethoylol-5,5 dimethylhydantoin, dimethylol urea, 2-bromo-2.-nitropropane-1,3-diol, oxazolidines, sodium

hydroxymethyl glycinate, 5 hydroxymethoxymethyl-l-laza-3, 7-dioxabicyclo [3.3.0] octane, 5-hydroxymethyl-l-laza-3,7-dioxabicyclo [3.3.0]octane, 5-hydroxypoly[methyleneoxy]methyl-l-laza-3,7-dioxabicyclo [3.3.0] octane, quaternary adamantine and combinations thereof inside said tube, ~~wherein said compounds (22) are in a volume of no greater than 2 parts; and~~

(b) collecting said cells in said collection container ~~[(10)]~~, wherein after collection of the cells in the container, the ratio of the volume of any preloaded compounds to the combined volume of the cells and the compounds is less than about 2:100.

Claim 28 (currently amended): The method of Claim 1, ~~wherein said compounds (22) are in a volume of no greater than 1.5 parts~~ the ratio of the volume of any preloaded compounds to the combined volume of the cells and any preloaded compounds is less than about 1.5:100.

Claim 29 (currently amended): The method Claim 28, ~~wherein said compounds (22) are in a volume of no greater than 1 part~~ the ratio of the volume of any preloaded compounds to the combined volume of the cells and any preloaded compounds is less than about 1:100.

Claim 30 (currently amended): The method of Claim 3, wherein the concentration of said fixative agent ~~[(26)]~~ preloaded in said tube ~~[(12)]~~ is less than about 0.75 g/ml of preloaded compounds.

Claim 31 (currently amended): The method of Claim 30, wherein the concentration of said fixative agent ~~[(26)]~~ preloaded in said tube ~~[(12)]~~ is less than about 0.5 g/ml of preloaded compounds.

Claim 32 (currently amended): The method of Claim 4, wherein the concentration of said anticoagulant agent $[(24)]$ preloaded in said tube $[(12)]$ is less than about 0.2 g/ml of preloaded compounds.

Claim 33 (currently amended): The method of Claim 32, wherein the concentration of said anticoagulant agent $[(24)]$ preloaded in said tube $[(12)]$ is less than about 0.15 g/ml of preloaded compounds.

Claim 34 (currently amended): The device of Claim 14, wherein ~~said compounds (22) are in a volume of no greater than 1.5 parts~~ the ratio of the volume of any preloaded compounds to the combined volume of the cells and any preloaded compounds is less than about 1.5:100.

Claim 35 (currently amended): The device of Claim 34, wherein ~~said compounds (22) are in a volume of no greater than 1 part~~ the ratio of the volume of any preloaded compounds to the combined volume of the cells and any preloaded compounds is less than about 1:100.

Claim 36 (currently amended): The device of Claim 16, wherein the concentration of said fixative agent $[(26)]$ positioned within said container $[(10)]$ is less than about 0.75 g/ml of preloaded compounds.

Claim 37 (currently amended): The device of Claim 36, wherein the concentration of said fixative agent $[(26)]$ positioned within said container $[(10)]$ is less than about 0.5 g/ml of preloaded compounds.

Claim 38 (currently amended): The device of Claim 17, wherein the concentration of said anticoagulant agent $[(24)]$ positioned within said container $[(10)]$ is less than about 0.2 g/ml of preloaded compounds.

Claim 39 (currently amended): The device of Claim 38, wherein the concentration of said anticoagulant agent $[(24)]$ positioned within said container $[(10)]$ is less than about 0.15 g/ml of preloaded compounds.

Claim 40 (currently amended): A method for preparing mammalian whole blood cells for analysis, said method comprising:

(a) providing a collection container $[(10)]$ for receiving a whole blood sample ~~volume of 400 parts;~~

(b) introducing into the collection container ~~(10) a volume of no greater than 2 parts of~~ preloaded compounds $[(22)]$ that include an anticoagulant agent $[(24)]$ and a fixative agent $[(26)]$ selected from the group consisting of diazolidinyl urea, imidazolidinyl urea and a mixture thereof;

(c) evacuating the collection container $[(10)]$ to an internal pressure that is less than atmospheric pressure outside said container;

(d) drawing a volume ~~of 100 parts~~ of a whole blood sample into the collection container $[(10)]$, wherein the ratio of the volume of any preloaded compounds to the combined volume of the whole blood sample and the compounds is less than about 2:100; and

(e) mixing the preloaded compounds $[(22)]$ with the whole blood sample in the collection container (10) so that cells of the whole blood sample are contacted with the preloaded compounds $[(22)]$.

Claim 41 (currently amended): The method of Claim 40, wherein the compounds [(22)] consist essentially of the anticoagulant agent [(24)] and the fixative agent [(26)] selected from diazolidinyl urea, imidazolidinyl urea, and a mixture thereof.

Claim 42 (currently amended): The method of Claim 41, wherein the anticoagulant agent [(24)] is selected from ethylene diamine tetra acetic (EDTA), salts of EDTA, and a mixture thereof.

Claim 43 (currently amended): The method of Claim 42, wherein the anticoagulant agent [(24)] is K³EDTA present in an amount of less than about 0.3 g/ml of preloaded compounds.

Claim 44 (currently amended): The method of Claim 41, wherein the fixative agent [(26)] consists of diazolidinyl urea present in an amount of less than 1 g/ml of preloaded compounds.

Claim 45 (currently amended): The method of Claim 40, said method further comprising storing the whole blood sample in the collection container [(10)] after mixing and prior to analyzing.

Claim 46 (previously presented): The method of claim 45, wherein said whole blood sample is stored at ambient temperature for a period of at least 3 days prior to analyzing.

Claim 47 (currently amended): The method of Claim 40, said method further comprising transporting the whole blood sample in the collection container [(10)] from the collection site to the analysis site.

Claim 48 (previously presented): The method of Claim 45, wherein said analyzing includes screening the whole blood cells for HIV.

Claim 49 (currently amended): A method of screening a subject for abnormal cells or tissues, comprising the steps of:

- (a) collecting a cell or tissue sample from said subject using the device [(100)] of Claim 14;
- (b) analyzing collected cell or tissue sample for abnormality using a flow cytometer, a hematology analyzer, or a combination thereof; and
- (c) providing the results of analysis for identification.

Claim 50 (previously presented): The method according to claim 49, wherein said abnormal cells or tissues are indicative of a disease selected from the group consisting of HIV, HPV, hepatitis, leukemia, cancer, and a combination thereof.

Claim 51 (new): A device for collecting mammalian cells comprising:

- (a) a container having an internal pressure less than atmospheric pressure outside said container;
- (b) preloaded compounds positioned within said container, wherein said compounds include imidazolidinyl urea and EDTA, wherein the imidazolidinyl urea is present in an amount of less than about 1 g/ml of preloaded compounds.